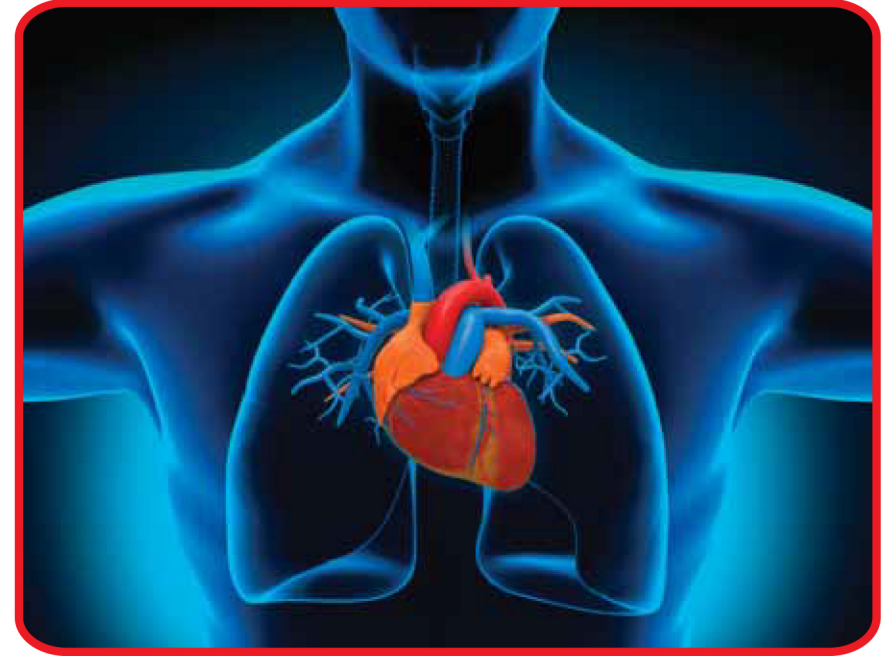


CARDIOPULMONARY DIAGNOSTIC SERVICES



For further information, please contact:

Cardiopulmonary Diagnostic Services

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آغا خان یونیورسٹی ہسپتال، کراچی

The Aga Khan University Hospital, Karachi



Cardiopulmonary Diagnostic Services

Early diagnosis of cardiac diseases plays a vital role in the treatment of heart problems. It not only provides doctors the guidelines for deciding the course of treatment for their patients, but also gives prior warning to the patients for improving their lifestyle and taking preventive measures for minimizing the risk of a heart attack.

In view of the significance of early diagnosis of heart diseases, Aga Khan University Hospital offers state-of-the-art cardiopulmonary diagnostic services with special emphasis on promptness of service and accuracy of results. You will be in the safe hands of highly skilled consultants and staff, who with the help of the most modern screening and diagnostic facilities, provide you the definite answers for cardiac problems. The following non-invasive cardiopulmonary diagnostic tests are available at Aga Khan University Hospital.

Resting Electrocardiogram (ECG)

Resting Electrocardiogram (ECG) is a simple test which is commonly used for basic evaluation of cardiac status. It records intrinsic electrical activity of the heart by placing electrodes on the limbs and chest. The recorded signals provide useful information regarding previous damage to the heart muscles, enlargement of heart chambers and abnormalities of the electrical system of the heart.

The most valuable role of ECG is in the diagnosis and initial management of acute heart attack.



Preparations for the test

No special preparation is required and the test can be done without prior appointment during working hours.

Ambulatory Ecg (Holter) Monitoring

In this test, the Electrocardiogram (ECG) is continuously monitored for 24 to 48 hours. The equipment signals are recorded on a special recorder which is worn by the patient. This prolonged monitoring records transient rhythm or ECG abnormalities. This test is especially useful in patients with



palpitations, giddiness or fainting spells. It can also help in assessing response to drug therapy. Currently we have the capability to extend monitoring beyond 48 hours, upto a week.

Preparations for the test

- There is no need for fasting or any other special preparation. Take all your prescribed medications as usual and record them in the diary provided. Wear loose fitting clothes while coming to the hospital.
- In the Holter hook-up room, surface electrodes will be placed on the upper chest, the electrodes will be connected to a recorder, the size of a small cassette player, which will be strapped around your waist. You will wear it continuously for 24 to 48 hours as requested by your physician. Please do not remove the electrodes on your own.
- You will be asked to keep a diary to record all your activities and any symptoms with the exact time of their occurrence. It is a good idea to synchronize your watch with the timer on the recorder. Please carry out all your activities as usual except for bathing.
- You will be advised to return to the hospital at a given time to have the recorder removed for analysis.



Event Recorder

In case extended period of monitoring is required, a more specialized equipment called "Event Recorder" can be used. This mode of monitoring is particularly useful for patients who have very infrequent symptoms.

Exercise Tolerance Test (ETT)

Exercise Tolerance Test (ETT) assesses the response of your heart to increased workload and demand for blood. This is done by recording the ECG while you are walking on a treadmill machine.



Preparations for the test

- You may be asked to stop certain medications a day before the test. Please confirm this with your doctor.
- On the day of the test, do not eat or drink anything for at least four hours before the test.
- Please bring comfortable walking shoes but not chapals and wear loose fitting clothes. For male patients, it may be necessary to shave the chest to allow for attachment of ECG electrodes.
- If you are suffering from fever or any other ailment, please inform the staff, so that you can be evaluated by the doctor before the test.

Once you start walking on the treadmill, your blood pressure, heart rate, general condition and ECG will be monitored continuously. After every three minutes, the speed and incline of the treadmill will be increased. You will be encouraged to exercise for as long as you can and the test will be continued till you reach a desired heart rate or cannot exercise any more (usually 10 - 15 minutes). After the test, you will be asked to rest while ECG and blood pressure are recorded till you reach the baseline heart rate. All the recordings are analyzed by a cardiologist and the results made available in a few days.

Safety of the test

Exercise treadmill testing is very safe. Some patients might experience chest pain during the test. However, the risk of heart attack or abnormal

heart beat is extremely low. A doctor is in attendance during the test to ensure your safety.

Echocardiogram

High frequency sound waves (ultrasound are used) to take images and measurements of different parts of the heart. Images are recorded in digital format which are reviewed by a cardiologist. No radiation (X-ray) is involved.

Adult Echocardiogram

Preparations for the test

On the day of the test, you can eat or drink as usual and should take all prescribed medications. No special preparation is needed.



About the test

The test is performed by a specially trained echocardiologist. A doctor may assist the technologist if there is a need. You will be asked to change into a hospital gown and electrodes will be applied. Gel is used for better contact between transducers and skin. The test will involve placing a transducer on the chest wall over the heart. Room lights will be dimmed to improve TV screen pictures. The whole test will take 30 to 45 minutes.

Paediatric and Fetal Echocardiogram

Introduction of Echocardiography

Echocardiography is an indispensable, non-invasive ultrasonic procedure used in the diagnosis and management of cardiac diseases.

Echocardiography is a procedure in the practice of paediatric cardiology.



It can be performed on the fetus, newborns, infants and children.

Preparations of the test

There is no need to withhold food or drink. Paediatric patients have to be quiet during the study. They may have to be sedated with a mild oral or intranasal sedative, in which case no oral feeds should be given until the child is fully awake after the feed.

Fetal Echocardiogram is best performed between 20 and 24 weeks (5 - 6months) of gestation and pregnancy and no special preparation is required.

About the test

The test is performed by paediatric cardiologist and assisted by a specially trained echo-technologist. The test takes approximately forty minutes.

Safety of the test

This is a very safe test and up till now no adverse effects of diagnostic ultrasound have been reported.

Stress Echocardiogram

Stress Echocardiogram is a diagnostic test that uses ultrasound images of the heart to supplement ECG information obtained during a stress test. The results obtained by Stress Echocardiography are comparable to nuclear stress tests and are being used in major medical centres across the world to assess the probability of coronary artery blockages or viability of damaged heart muscles. Additional information about intra cardiac pressures, cardiac waves and relation properties may be obtained at the referring cardiologists discretion.

Preparations for the test

- You should not eat or drink anything for at least 4 - 6 hours before the test. Take your medications as usual with a few sips of water, but do not take drugs called Beta-Blockers on the day of the test unless specifically advised by your doctor.
- Wear loose clothing and comfortable flat soled walking shoes but no chapals.
- For male patients, it may be necessary to shave the chest before the test.
- If you suffering from fever or any other ailment, please inform the staff/doctors.

About the test

All stress tests are performed under supervision of a doctor. There are two forms of Stress Echocardiogram. If you are able to exercise vigorously on

a treadmill, an exercise echocardiogram will be performed. The second method of stressing the heart is with administration of special medication intravenously that simulates exercise.

Safety of the test

Stress Echocardiography is a very safe test. However, some patients could develop chest pain, irregular heart beat or blood pressure changes. Stress Echocardiography is as safe as a regular nuclear exercise stress test. It gives the same type of information as a nuclear stress test, but without any radiation exposure.

Transesophageal Echocardiogram (TEE)

It is a diagnostic procedure in which a tube with a tiny ultrasound probe is inserted through the patient's mouth and pictures of the heart are obtained using sound waves. The procedure is performed by an experienced cardiologist.

Preparations for the test

- You should not eat or drink for 6 hours before the test. If the test is in the afternoon, take your morning medicines as usual. If the test is in the morning, do not take your routine medicines.
- Before the procedure, you will be asked to give written consent to perform the test. You should make arrangements for a responsible adult to take you home as you will receive sedating medications.
- After the test, you should not eat or drink anything for 4 hours and should not drive or operate heavy machinery for 12 hours.
- If you are on a special kind of blood thinner called warfarin, you may be asked to discontinue it a few days before the test.

How is the test done?

You will be asked to change into a hospital gown. Your throat will be sprayed with an anaesthetic solution to numb it and you will be given an intravenous sedative as well. The TEE tube will be introduced through the mouth into the food pipe and stomach. Initially you will be asked to swallow repeatedly. This will facilitate passage of the tube to pass from the back of the throat and minimize discomfort. It takes upto 30 - 40 minutes to obtain different views of the heart.

After the procedure you will be observed by our staff for sometime before being allowed to go home. Sometimes you may feel soreness in the throat for one or two days after the test.

Safety of the test

TEE is a semi-invasive procedure and carries a small risk of trauma to the food pipe or throat. However, be assured the complications are very rare and all necessary precautions will be taken to minimize the risk.

Ambulatory Blood Pressure Monitoring

Occasional blood pressure measurements taken at home or in a clinic at times do not provide adequate information and your physician may ask for this test. This test monitors blood pressure on an hourly basis for 24 hours and readings are recorded on a special recorder. These readings are then analysed by sophisticated equipment and the results are interpreted by an experienced cardiologist.



Preparations for the test

- Patients should take their meals and medications regularly.
- Wear clothes with loose sleeves
- Equipment consists of a recorder, the size of a small cassette player and a blood pressure cuff, which is applied to the arm. You will wear the cuff continuously for the duration of the test. The cuff will inflate automatically every hour to record your blood pressure.
- Please carry out all your activities as usual except bathing.
- You will be asked to keep a diary to record all your activities and any symptom with the exact time of its occurrence.
- You will be instructed to return to the hospital at a given time to have the



equipment removed.

- It is a good idea to synchronize your watch with the timer or the recorder.

Head-up Tilt Table Test

Some patients complain of dizziness or episodic loss of consciousness without any cause. This special test is performed to try to identify the cause. During the test, the patient is tilted head up to a certain angle for up to 45 minutes, while heart rate, ECG and blood pressure is continuously monitored. Any change in heart rate, blood pressure or recurrence of symptoms is carefully observed.

How is the test done?

- You should be fasting for six hours before the test. Your physician might instruct you to stop some medications before the test.
- You can take prescribed medicines with few sips of water.
- Wear loose fitting clothes.
- You will be asked to be flat on the tilt table.
- Electrodes for ECG monitoring will be placed on the chest, while a blood pressure cuff will be placed on one arm and IV cannula on the other arm.
- After recording blood pressure, pulse and baseline ECG in supine position, restraining straps will be placed over you and the table will be tilted to 60 degree with head up.
- ECG and heart rate will be continuously monitored and blood pressure will be recorded after every 3-5 minutes. The test will be terminated if you complain of a dizzy feeling and if blood pressure or heart rate drops below a certain level. If no significant changes occur, the test will be stopped after 45 minutes. You will be observed for sometime before being allowed to go home.

Safety of the test

Some patients have unpleasant feelings during the test and may faint. However, rest assured this is a very safe test and a physician is in attendance during the test.

Heart Rhythm Device Clinic

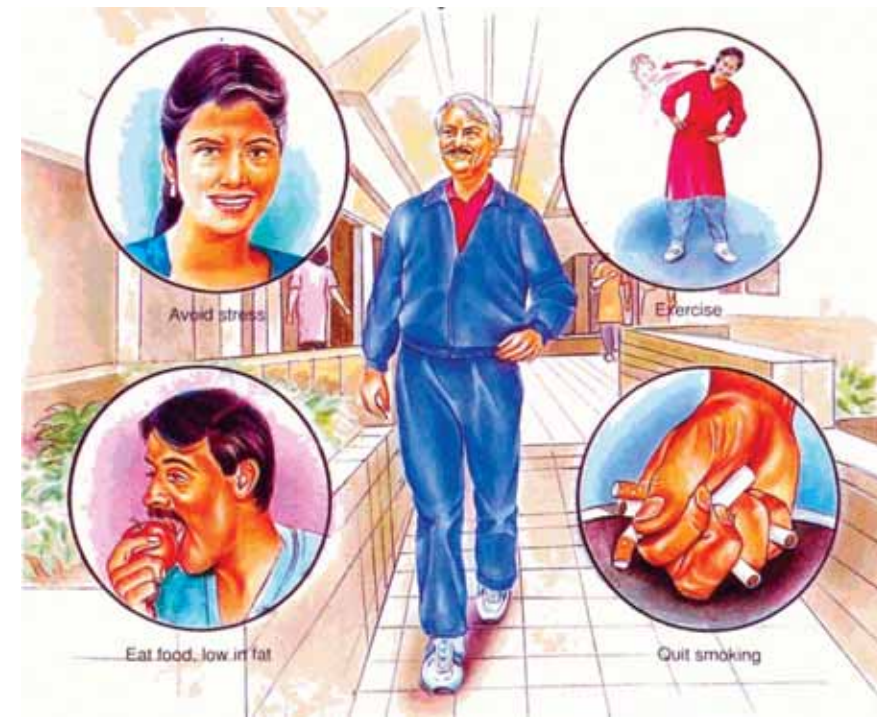
This is a unique service provided by Aga Khan University Hospital for the benefit of patients who have permanent pacemakers and other devices in place. Although modern technology has made new permanent pacemakers very dependable with long battery lives, but a regular check-up is important

to ensure a smooth and trouble-free service. Aga Khan University Hospital has the facilities for checking pacemakers of all major manufactures such as Intermedics, Medtronic and Teletronics. You may be able to avail this facility even if your pacemaker was implanted at some other hospital. During these check-ups, pacemaker functioning and battery life can be assessed using sophisticated equipment and its programming can be adjusted to best suit your needs.

How is the test done?

- No particular preparation is needed.
- You should take meals and all the prescribed medications as per routine.
- You may be requested to change into a hospital gown.
- A magnet wand is placed over the pacemaker on the chest wall and different readings are obtained.
- Depending on the type of pacemaker and the request of your physician, the whole procedure may take 20 to 40 minutes.
- A physician is available during the procedure.
- The readings will be provided to you at the end of the test if required, for your physician's review.
- Please bring identifying information about your device as well as the record of the last checkup especially if it was performed at another hospital.

We Can Prevent Cardiac Diseases!



Minor changes in our lifestyles can have a dramatic effect on our health and are the best method to prevent cardiac diseases. You can make a real difference by:

- Quitting smoking;
- Exercising regularly (walking, cycling, etc);
- Avoiding foods high in fat content and cholesterol;
- Regular medical check-ups;
- Having a balanced lifestyle between work, play (fun, social activities) rest and relaxation.